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strained seem to serve their purpose: *e. g.*, John's Christmas money, the relative probability of his receiving a dollar from different sources, is carried through the entire chapter on the cause of variability.

Some useful adaptations of principles are worked out by the author as special methods of procedure in psychological research: *i. e.*, the transmutation of relative measures into those of quantity. The author's discussion of the zero point of a series seems unnecessarily confusing; in this as in several other instances he gives the reader the impression that he is in too great haste to get to the end. The standard deviation is represented in the exponential formula by  $\mu$  and in the text by  $\sigma$ ; as this occurs on the same page without explanation it will confuse the student. The distinction between the mode and the average is dwelt upon at length, but it would have been more emphatic if a brief mathematical demonstration had been added. In the treatment of accuracy of measurements the student should have been given the simple formula for the correction of the standard deviation. These are some of the instances in which the author's fear of mathematics led him to eliminate matter that is really useful to the reader even though he must take its verity on faith.

The appearance of the book is an encouraging sign that psychology may be about to begin substantial advance in one important part of its field. As a text book for a preparatory course to psychological investigation it has many points of excellence, but the author's hope that it will be of great service to the unmathematical reader is not well grounded, for it is the experience of the reviewer that even such a presentation reaches only the mathematically inclined.

CLARK WISSLER.

*Notes d'archéologie préhistorique. — Nos ancêtres primitifs.* Par A. DOIGNEAU. Preface par le Docteur Capitan. Paris: Librairie C. Clavreuil. 1905. 8°, 202 pages, 109 figures.

This volume is very well characterized by the author in the dedication as "a work of popularization"; and again by Dr Capitan in the preface as "a concise résumé of the history of our primitive ancestors." Turning to the table of contents, the history is found to be limited to the chapters dealing with the ages of stone. Such a work marks a timely step in the right direction. The domain of prehistoric archeology is a broad one. The period of pioneering has therefore of necessity been long. But there comes a time in the development of a science, as in that of a country, when the trail should give place to the highway. There are those who will always prefer the trail. Let them still wander to their heart's content through the wilderness. Their course leads by way of the numerous

publications of museums, societies, academies, etc.; of scientific journals, government reports, books of travel, as well as works on special topics. But that way is too laborious for the great majority whose means of communication should be as easy and direct as possible, and who may choose to be personally conducted. In that case, Doigneau is recommended as their guide. He knows the field and has supplemented his text by copious references to the original sources of information.

In archeology it is necessary to know the when as well as the what and the where; hence the importance of chronological classification. In prehistoric archeology the chronology is of necessity relative rather than absolute. The author offers nothing new in the way of classification, his outline agreeing practically with that made by Gabriel de Mortillet<sup>1</sup> more than ten years ago. The stone age is divided into three periods: (1) eolithic, (2) paleolithic, and (3) neolithic. It is well known that to Sir John Lubbock (Lord Avebury) belongs the credit of first employing the terms paleolithic and neolithic. As to the name eolithic, the author leaves one to infer (p. 36) that it was introduced by G. de Mortillet. Dr A. Rutot<sup>2</sup> of Brussels also believes him to have been the first to propose that name to designate a primitive industry antedating the paleolithic. In the opinion of the reviewer, and as stated by him in a paper written last year but not yet published, the priority belongs to Mr J. Allen Brown, late fellow of the Geological Society of London, who made use of the term "eolithic" in a communication<sup>3</sup> read before the Anthropological Institute of Great Britain and Ireland on March 8th, 1892, whereas de Mortillet submitted his "Classification palethnologique" to the Paris Society of Anthropology on December 6, 1894.

The eolithic period of Doigneau, like that of de Mortillet, is placed wholly in the Tertiary. The paleolithic is referred to the early Quaternary and the neolithic to the Recent. On the other hand Rutot has recently shown that the eolithic is by no means confined to the Tertiary — Reutelian, Reutelo-Mesvinian, and Mesvinian industries all occurring in the lower Quaternary. In regard to the subdivisions of the paleolithic period, the author does not seem to share the opinion of Professor Hoernes<sup>4</sup> and others that the Chellean, Acheulian, and

<sup>1</sup> Classification palethnologique, *Bull. Soc. d'anthr. de Paris*, 1894, p. 616.

<sup>2</sup> Le préhistorique dans l'Europe centrale, etc. *Extrait du C.-R. du Congr. d'arch. et d'hist.*, Dinant, 1903, p. 244.

<sup>3</sup> On the continuity of the paleolithic and neolithic periods. *J. A. I.*, xxii, 93.

<sup>4</sup> Page 616 of the Bulletins.

<sup>5</sup> Moriz Hoernes, *Der diluviale Mensch in Europa*, Braunschweig, Friedrich Vieweg und Sohn, 1903 (reviewed in *American Anthropologist*, N. S., 1903, v, 695).

Mousterian epochs are but phases of one and the same industry. Yet he goes so far as to admit that: the Acheulian cannot be considered as constituting a veritable epoch. It is at the same time the end of the Chellean and the beginning of the Mousterian, a passage from the one to the other, and marking a relatively short period of time. The Solutrean is also looked upon as a transition epoch. A good deal of space is given to the closing epoch of the paleolithic period which was marked by a real passion for art. Indeed the Magdalenian epoch may well be called the Phidian age of prehistoric times. Records have been preserved of each successive step from sculpture in the round, through high-relief and low-relief to delicate engraving. Color was sometimes combined with engraving, as in the remarkable frescoes which adorn the cavern walls of Fond-de-Gaume, near Les Eyzies. Curious markings suggestive of a halter on some of the figures of horses from the cavern walls of Combarelles, also near Les Eyzies, have led to the question of domestication of animals during the paleolithic period. Doigneau does not believe the evidence sufficient to demonstrate that any animal had become domesticated previous to the arrival of the neolithic peoples in Europe.

The closing chapter deals with the neolithic period; the hiatus, supposed by some to separate it from the paleolithic, the author believes to be non-existent. In support of this view he marshals the evidence furnished by the researches of de Mortillet at la Tourasse (Haute-Garonne), Piette at Mas d'Azil (Ariège), Salmon and Capitan at Campigny (Seine-Inférieure), and d'Ault du Mesnil in the valley of the Somme. The Tourassian is a transition epoch. The Campignian epoch is characterized by the survival of a few ancient types, such as scrapers, double scrapers, and graters, and the appearance of two new types, the paring-knife and the pick. Nowhere was there the slightest evidence of an attempt at polishing the stone implements. This was reserved for the following epoch, the so-called Robenhausian.

The story as told by Doigneau is attractive throughout. The excellent figures are, happily, almost exclusively of specimens in his own collection. The references, though numerous, are wholly confined to French authors or French translations of foreign authors, with the exception of citations from a few classical writers — a limitation perhaps more apparent than real when the scope of the work is taken into consideration. A few typographical errors are noted, among which may possibly be classed the statement that *Pithecanthropus* was found *near* Java.

GEORGE GRANT MACCURDY.